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THE AMERICAN JOURNAL OF PHARMACY

MARCH, 1916

THE CONSTITUENTS OF LICORICE ROOT AND OF LICORICE EXTRACT.

PART 2.

By PERCY A. HOUSEMAN, PH.D., F. I. C.

Since the appearance of Part 1¹ of this paper I have carried out a considerable amount of work on licorice, aiming at the improvement of the method of analysis, but have not seen fit to make any decided changes in the method previously given by me. The separation of the glycyrrhizin from the starch and gums is now effected with 75 per cent. alcohol, as it was found that 80 per cent. alcohol precipitated, in some cases, a small quantity of glycyrrhizin. The crude glycyrrhizin is still determined by precipitation with dilute sulphuric acid, no other method having been found practicable. The method for sugars remains unaltered, and gives reliable results.

Partly because of the imperfections in the methods of analysis, and partly because of the large fluctuations in the composition of pure licorice root and extract, chemical standards of purity have not yet been established for these materials.

In Part 1 there was discussed the behavior of various solvents toward licorice root from different localities. The quantitative differences found were much less marked than might have been expected, considering the marked differences of flavor of the various roots and extracts. These differences of flavor are possibly to be ascribed to the nature, rather than to the amount, of the flavored constituents.

A summary is here made of the results of some recent extractions of licorice root with ether, 99 per cent. alcohol, 75 per cent. (by

¹ This JOURNAL, 1912 (vol. 84), No. 12, pp. 531-546.

volume) alcohol, 50 per cent. (by volume) alcohol, and water (see Tables 1, 2 and 3).

A comparison of these results with those given in Part I shows:

SUBSTANCES DISSOLVED FROM LICORICE ROOT BY VARIOUS SOLVENTS.
(The solvents were used in the order given below.)

	Ana- tolian	Russian	Syrian	Turkish- Arabian	Spanish (Toledo)	Italian
TABLE 1.						
Root moisture.....	4.0	4.0	4.5	3.0	3.5	4.5
Ether.....	3.6	3.6	4.9	3.7	2.9	3.6
99 per cent. alcohol.....	2.0	2.2	2.1	2.1	2.0	1.6
50 per cent. alcohol.....	28.2	25.9	23.0	20.5	22.6	25.0
Hot water.....	5.5	4.7	3.9	3.9	6.4	8.2
Spent root.....	56.7	59.6	61.6	66.8	62.6	57.1
	100.0	100.0	100.0	100.0	100.0	100.0
TABLE 2.						
Root moisture.....	2.2	2.5	2.2	2.2	2.0	2.1
99 per cent. alcohol.....	5.5	5.6	7.0	5.4	4.9	4.8
75 per cent. alcohol.....	23.3	22.2	19.1	16.9	19.7	21.2
Hot water.....	10.9	10.0	8.2	8.9	9.9	12.2
Spent root.....	58.1	59.7	63.5	66.6	63.5	59.7
	100.0	100.0	100.0	100.0	100.0	100.0
TABLE 3.						
Root moisture.....	6.5	7.5	8.0	7.0	7.0	8.0
Hot water.....	37.1	35.7	31.8	29.6	33.3	36.3
75 per cent. alcohol.....	4.0	3.5	4.1	3.4	2.8	3.4
Spent root.....	52.4	53.3	56.1	60.0	56.9	52.3
	100.0	100.0	100.0	100.0	100.0	100.0

1. *Ethereal extracts* range from 2.9 per cent. to 4.9 per cent. (Table 1) and agree fairly with those of Part I.

2. *Alcoholic Extracts*.—99 per cent. alcohol extracts 4.8 per cent. to 7.0 per cent. (Table 2), whereas 95 per cent. alcohol, which was used in Part I, extracted 10.8 to 12.7 per cent. The figures obtained with 99 per cent. alcohol give results which correspond more nearly to the true amount of total resins present than do those previously obtained with 95 per cent. alcohol, since the latter extracts from licorice root other materials besides resins, notably cane-sugar, as was shown in the detailed analysis of these extracts (Table 9, Part I).

It is to be noted that R. Kobert,² in an article concerned chiefly

² *Berichte der Deutschen Pharmazent. Gesellschaft*, 1915. Heft 4, pp. 169-185.

with the saponins of licorice root, reproduces Table 8 from my previous paper. He changes the heading of column 1 of that table to "Ether-soluble resins," and the heading of column 2 to "Ether-insoluble resins"; but the latter designation is incorrect, for the reason just stated above. B. Müller,³ in a translated summary of Kobert's article, also reproduces the same table, but has omitted to state that it is from my paper in this JOURNAL. The inference from the text of the translation is that the table is the work of Tschirch.

The 50 per cent. alcohol extracts (Table 1) compare well with those published in Part I of this paper.

In the new results the same feature is observed as was noted in Part I, viz., the different roots show smaller differences in the amounts extracted by the respective solvents than would be expected.

PREPARATION OF CANE-SUGAR FROM LICORICE ROOT.

Rasenack⁴ appears to have been the only worker who actually obtained and identified crystals of cane-sugar from licorice root. He observed a deposition of crystals of cane-sugar from an alcoholic extract of licorice root.

I have worked out a systematic preparation of cane-sugar from the root as follows:

Russian licorice root was ground, and macerated with cold 5 per cent. (by weight) sulphuric acid. Three liquors were taken off, pressing the root between each extraction. The liquors were united, centrifuged, exactly neutralized with sodium hydrate, brought to a boil, and filtered from albuminoids. The filtrate was evaporated *in vacuo* to small volume, and treated with about six times its volume of 95 per cent. alcohol, so that the mixture contained about 85 per cent. alcohol. The starch and gummy matters, together with precipitated sodium sulphate, were removed by filtration, and the clear brown solution again evaporated *in vacuo* to small volume. The liquid was then boiled for half an hour with a concentrated aqueous solution of strontium hydrate, allowing three parts of strontium

³ This JOURNAL, 1915 (vol. 87), No. 12, pp. 555-559.

B. Müller's translation of Kobert's article contains the following errata:

On p. 557, instead of $C_{44}H_{64}O_{10}$ read $C_{44}H_{64}O_{10}$.

On p. 558, instead of glycyrrhetic acid read glycyrrhetic acid.

On p. 558, instead of glycyrrhizic acid read glycyrrhizic acid.

⁴ *Arbeiten aus dem Kaiserlichen Gesundheitsamte*, 1908, vol. 28, p. 442.

hydrate to every one part of cane-sugar supposed to be present. The precipitated strontium sucrate was filtered hot and boiled a second time with strontium hydrate solution. The strontium in the precipitate was now removed by suspending in water and passing in carbonic acid gas. The light yellow filtrate was evaporated to a syrup, and repeatedly crystallized from boiling 95 per cent. alcohol.

The identity of the substance as cane-sugar was established by its crystalline form, by its specific rotatory power $[\alpha]_D = 66.3^\circ$, and by analysis.

	Calculated	Found
Carbon	42.07	42.00
Hydrogen	6.52	6.43
Oxygen	51.41	51.57
	<hr/> 100.00	<hr/> 100.00

The yield of cane-sugar was about 2 per cent. of the root used.

DETECTION OF SAPONINS IN LICORICE ROOT.

At the time my experimental work was carried out on saponins in licorice root (1914) nothing had been published on this subject. The presence of saponins in licorice root was rendered probable by a number of properties of the extract.

The hæmolysis test was used for the detection of biologically active saponins. The method employed was to obtain the supposed saponin in aqueous solution and mix it with salt solution, so as to produce a liquid containing 0.9 per cent. sodium chloride, and then add a suspension, in physiological salt solution, of the washed corpuscles of sheep- or ox-blood. Solution of the blood-corpuscles shows the presence of a saponin or sapogenin, or both.

Negative results were obtained with aqueous extracts of both green and dried licorice root. Mild and strong extractions were tried, but no hæmolysis was observed at any concentration.

Negative results were also obtained with extracts in which dilute alcohol up to a strength of 50 per cent. (by volume) was employed as a solvent.

Hæmolytically active saponins were extracted from both green and dried licorice root by 75 per cent. (by volume) alcohol. The 75 per cent. alcoholic extract was evaporated to dryness, the residue extracted with cold water, and tested with washed blood-corpuscles in

the usual manner. The limit of dilution for complete solution of the blood-corpuscles at room temperature was approximately 1 part of licorice root to 640 parts solution. In the particular samples tested, Syrian, Spanish, and Italian roots possessed the strongest hæmolytic power, and were followed by Russian, Anatolian, and Turkish-Arabian. It is likely that this order might be changed if a different set of samples of root were tested. I found, further, that the biologically active saponins of licorice root are in the *inner* bark, and are not contained in the outer bark, nor in the central part of the root. Comparative tests with soap-bark gave complete hæmolysis at a dilution of 1 to 2000 at 20° C.

R. Kobert ⁵ states that the sapogenin, glycyrrhetic acid, which is probably present in small amount in licorice root, is responsible for the hæmolytic activity of extracts from the root. It is, however, probable that glycyrrhetic acid would not be obtained in solution by the treatment of a 75 per cent.-alcohol extract with cold water. Moreover, glycyrrhetic acid is insoluble in ether, and ethereal extracts of licorice root contain hæmolytically active material. It seems likely, therefore, that licorice root contains an active saponin as well as a sapogenin. Kobert has given particular attention to the relation of glycyrrhizic acid to the saponins, and to the relation which Tschirch's formula, $C_{44}H_{84}O_{19}$, for glycyrrhizic acid bears to that of the general formula $C_nH_{2n-8}O_{10}$, which Kobert has established for saponins. Sormanni ⁶ found glycyrrhizic acid to be hæmolytically inactive. Kobert confirms this, and finds, further, that glycyrrhizic acid yields an active sapogenin (glycyrrhetic acid) on hydrolysis with dilute sulphuric acid. Both of these statements I have confirmed. Kobert concludes that glycyrrhizic acid is a member of the group of inactive saponins.

PREPARATION OF GLYCYRRHIZIN (GLYCYRRHIZIC ACID) FROM LICORICE ROOT.

Tschirch and Cederberg ⁷ have described the preparation of pure glycyrrhizin from licorice root. They precipitated an aqueous extract of the root with dilute sulphuric acid, and purified this crude glycyrrhizin by the preparation of the tertiary and primary potas-

⁵ *Loc. cit.*

⁶ *Zeit. f. Nahrungs- und Genussmittel*, 1912, 23, p. 56.

⁷ *Archiv der Pharmazie*, 1907, Heft 2, p. 97.

sium salts, passing to the free acid by means of the decomposition of the lead salt with sulphuretted hydrogen. The primary potassium salt and the free acid were purified by repeated crystallization from hot glacial acetic acid.

In preparing glycyrrhizin, I first extracted-decorticated licorice root about six times with 95 per cent. alcohol in order to remove resinous and bitter principles. The glycyrrhizin was then removed from the residual root with 30 per cent. alcohol, and was precipitated with dilute sulphuric acid after removal of the alcohol. It was thought that this would give a crude glycyrrhizin which would be more readily purified than that obtained by Tschirch's method of extracting the original root with water and precipitating with dilute sulphuric acid, since by this latter method a larger number of other constituents are mixed with the glycyrrhizin, and must be later separated.

The crude glycyrrhizin from 30 pounds of root was washed twenty times by kneading with warm water, and was treated with alcohol and ether as prescribed by Tschirch. The precipitates obtained from the addition of alcohol and ether were insignificant. The yield of tertiary potassium salt was 5.7 per cent. of the root. The tertiary potassium salt was converted to the primary potassium salt by means of hot glacial acetic acid. The primary salt was crystallized twice more from glacial acetic acid, and washed with the same solvent. A white product was obtained. The primary potassium salt was converted to the lead salt by dissolving it in warm dilute (1:4) alcohol and precipitating with basic lead acetate. The lead salt was converted to the free glycyrrhizic acid by means of sulphuretted hydrogen, according to the directions given by Tschirch. The solution of the glycyrrhizic acid was evaporated to dryness *in vacuo*, and crystallized twice from hot glacial acetic acid.

The following combustion figures were obtained after the glycyrrhizic acid had been allowed to stand over potash in a vacuum desiccator:

0.2914 g.	substance gave	0.6262 g.	carbon dioxide and	0.2028 g.	water.
0.3050 g.	"	"	0.6512 g.	"	" 0.2110 g. "
0.2978 g.	"	"	0.6344 g.	"	" 0.2010 g. "
0.2976 g.	"	"	0.6384 g.	"	" 0.2066 g. "
0.3000 g.	"	"	2.8 cc. nitrogen at 26° C.	and 768 mm. pressure.	
0.3000 g.	"	"	3.0 cc. " 23° C.	" 768 mm. pressure.	

	C	H	N
	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
Found { 1.....	58.62	7.80	1.05
2.....	58.25	7.75	1.14
3.....	58.11	7.57	
4.....	58.52	7.78	
Average.....	58.37	7.72	1.09
Calculated for $C_{44}H_{64}O_{19}$	58.90	7.19	
Calculated for $C_{44}H_{68}O_{19}$	58.64	7.61	
Calculated for $C_{44}H_{70}O_{19}$	58.51	7.81	
Calculated for $C_{44}H_{67}NO_{19}$	57.81	7.39	1.53
Calculated for $C_{44}H_{68}NO_{18}$	58.97	7.31	1.56
Calculated for $C_{44}H_{68}NO_{19}$	58.77	7.63	1.55

A portion of the glycyrrhizic acid upon which the above combustions were carried out was crystallized three times more from hot glacial acetic acid. Perfectly colorless crystals were obtained. This purified glycyrrhizic acid was then crystallized from 50 per cent. alcohol, from which it did not crystallize well.

Two nitrogen estimations were carried out on this product.

0.3028 g. substance gave 5.12 cc. nitrogen at 26° C. and 766 mm. pressure.
 2.2748 g. " " 4.54 cc. " " 22° C. " 769 mm. "

Nitrogen = 1.89 per cent., 1.89 per cent.

It is not intended to controvert here the finding by Tschirch, that glycyrrhizic acid contains no nitrogen. Tschirch has been confirmed in his work by Rasenack. It is, however, very remarkable that this substance, if free from nitrogen, should so tenaciously hold a nitrogenous impurity, in spite of the elaborate purification outlined above.

The glycyrrhizic acid, prepared as above described, became brown at 185° C., and partly melted, with frothing, at 203° to 205° C. It readily dissolved in warm water, and gelatinized on cooling.

Its behavior toward sulphuric acid and toward bromine is different from that of glycyrrhizin which has not been crystallized from acetic acid. A drop of twice normal sulphuric acid added to 1 cc. of a moderately strong aqueous solution of the purified glycyrrhizin produced no immediate precipitate. After some time the liquid became opalescent, but cleared on warming, and on subsequent cooling a granular precipitate was deposited, which redissolved on warm-

ing. Glycyrrhizin which has not been purified by crystallization from acetic acid is precipitated even by very dilute sulphuric acid, and the precipitate does not redissolve on warming. Pure glycyrrhizic acid absorbs bromine in the cold, but gives no precipitate. Impure glycyrrhizin or an aqueous solution of licorice extract gives an immediate precipitate with bromine, even in very dilute solution. The precipitate contains all of the glycyrrhizin, and is not dissolved on warming.

It is not clear why the glycyrrhizin purified with acetic acid should behave differently from crude glycyrrhizin toward bromine and toward sulphuric acid unless glycyrrhizic acid, being relatively sensitive towards decomposition, has possibly suffered some change by the action of hot glacial acetic acid.

OXIDATION OF GLYCYRRHIZIC ACID WITH POTASSIUM PERMANGANATE.

One gram glycyrrhizic acid was dissolved in a solution of 1 gram potassium hydroxide in 50 cc. water, and 3 grams potassium permanganate in 60 cc. water were added. After heating on the water-bath for 1 hour, the permanganate was decolorized. A further 1-gram permanganate in 20 cc. water provided an excess. Added 2 cc. alcohol (until the purple color was just destroyed). Filtered, and neutralized with dilute hydrochloric acid. The white flocculent precipitate (0.2 gram) was practically tasteless, and will be further investigated.

OXIDATION OF GLYCYRRHIZIC ACID WITH NITRIC ACID.

One gram glycyrrhizic acid was treated with 10 cc. fuming nitric acid. Brisk action occurred, with the development of heat and evolution of nitrous fumes. The blood-red solution was poured into water. The light yellow precipitate was very bitter, and was readily soluble in alcohol and in ammonia. The filtrate contained oxalic acid, and also a substance which dyes animal fibres a fast yellow. The solution of this dye has a very bitter taste, but does not contain picric acid.

The resins (soluble in ether) and the bitter principles (soluble in alcohol, insoluble in ether) of licorice root both show behavior toward nitric acid similar to that shown by glycyrrhizic acid.

ISOLATION OF A YELLOW DYE FROM LICORICE ROOT.

A piece of silk dipped in an aqueous licorice extract is dyed a pale but fast yellow. The dye is obtained by percolating licorice root with hot water, evaporating the solution to dryness, and extracting with absolute alcohol. The alcoholic solution is evaporated to dryness, and the dye extracted with hot water. The dye is not picric acid.

I wish to express my thanks to Mr. Bertrand Schneeberg for valuable assistance in this work, and to the MacAndrews & Forbes Company for generously encouraging it, even though direct commercial application of the results may not always be evident.

Laboratory of the MacAndrews & Forbes Company,
Camden, N. J., December, 1915.

COSMETICS AS DRUGS.

A REVIEW OF SOME OF THE REPORTED HARMFUL EFFECTS OF THE ORDINARY CONSTITUENTS OF WIDELY USED COSMETICS.¹

By MARTIN I. WILBERT, Technical Assistant Division of Pharmacology Hygienic Laboratory, United States Public Health Service.

Of the many and varied abuses of drug products there is none in which fraud, deception and a wanton disregard for human health and even life are so clearly evidenced as in connection with the manufacture, sale, and use of so-called "cosmetics."

While no one can deny that emollient, irritant, and even caustic drugs, applied as cosmetics, have a legitimate and an important field of usefulness, the abuse of these same drugs, because of the misleading claims made in connection with many of the so-called cosmetics of a proprietary nature, involves a menace that should be recognized and guarded against.

More than thirty years ago, Tuttle (*Med. Rec.*, 1884, vol. 25, p. 257), in discussing the constituents and general effects of this class of preparations, said: "It is a reproach to modern civilization that one should find occasion in this day of enlightenment to raise his voice against the use of cosmetics."

That this statement is even more applicable to-day than when it

¹ Reprint from the Public Health Reports, vol. 30, No. 42, October 15, 1915.

was written is evidenced by the following table compiled from the publications of the Thirteenth Census of the United States:

Number of Establishments Engaged in the Manufacture of Perfumery and Cosmetics, the Cost of Materials Used, and the Value of the Product as Manufactured, Compared with the Population of the United States, Exclusive of Outlying Possessions, During the Corresponding Period.

[Thirteenth Census of the United States, 1910, vol. 8, p. 452, and vol. 1, p. 127.]

Year	Number of establishments	Cost of material	Value of product	Population of United States	Year of census
1879.....	67	\$1,201,409	\$2,203,004	50,155,783	1880
1889.....	157	2,128,420	4,630,141	62,947,714	1890
1899.....	262	3,135,017	7,087,704	75,994,575	1900
1909.....	429	5,634,031	14,211,969	91,972,266	1910

The establishments included under the heading "perfumery and cosmetics" are those engaged principally in the compounding of perfumes, face lotions, and cosmetics generally, and the list does not include the many hundred laboratories in which these same preparations may be compounded as a side line. Including the value of the product made by laboratories primarily engaged in the compounding of regular pharmaceutical preparations, a very conservative estimate of the cost of cosmetic preparations to the consumer would be in excess of \$50,000,000 annually.

Among the preparations usually classed as cosmetics for use on the head and face we have: Hair washes, hair tonics, hair dyes, shampoo powders, complexion powders, toilet powders, moth and freckle lotions, face enamels, toilet waters, toilet vinegars, grease paints, face creams, liquid enamels, beauty washes, and the many preparations that are offered as a "skin bleach."

The misuse of drugs in the form of "beautifying agents" is principally due to the fact that the federal and many of the state food and drug laws do not include preparations made and sold as cosmetics, unless curative claims are made on the label or in the literature accompanying the package as proof that the preparation is sold or is to be used "for the cure, mitigation, or prevention of disease either of man or other animals."

In only five states and the territory of Hawaii is the definition of a drug sufficiently broad to include preparations sold as cosmetics, but even in these states no provision is made to warn the purchaser of the presence of harmful or deleterious substances.

The general adoption of the more comprehensive definition of a drug to include antiseptics, disinfectants, washes, perfumes, and cosmetics would tend to provide some degree of control over preparations of this kind and prevent much of the present-day fraud. It would, however, fail to efficiently safeguard the user unless the list of drugs to be announced on the label were at the same time extended to include the many poisonous drugs that are at the present time falsely labelled "harmless."

As an illustration of the fraudulent practices existing in connection with the manufacture and sale of toilet preparations it will suffice to quote the following from recent reports of chemists in charge of State laboratories:

Barnard, H. E. (Rep. Indiana Bd. Health, 1912, 1914, p. 455): Eighty-one samples of preparations used as hair tonics, skin foods, cold creams, mouth washes, and lotions of varying character were examined. Thirty of the samples were classed as illegal. Seven contained methyl or wood alcohol.

Newcomb, George D. (*Proc. Iowa Pharm. Assoc.*, 1914, p. 28): Of the 66 toilet preparations examined, 20 contained methyl alcohol. Among the toilet preparations were the following: egg shampoo, hair tonics, bay rum, witch-hazel, toilet waters, Florida water, and perfume.

The dangerous character of wood alcohol is so well established that it would appear almost incredible that any one would dare offer a preparation containing it for use on the human body. A recent editorial on the subject (*Jour. Amer. Med. Assoc.*, 1914, vol. 62, pp. 538-539) asserts that nearly a thousand cases of poisoning attributed to wood alcohol have been reported in the literature since 1893. Many state laws, however, specifically permit its use in preparations designed for external application, and even in states in which such use is illegal it is difficult to secure the conviction of persons selling preparations containing it.

Wood alcohol is, however, but one of the many poisonous drugs that have been found in so-called "cosmetics." Many writers and investigators have from time to time called attention to the possible harmful effects of preparations that are sold as beautifying agents, but up to the present time the problems involved have not been given the attention they properly deserve.

Of the potent drugs of a possibly harmful nature that are used in

so-called "hair restoratives" it will suffice to mention: Lead acetate, silver nitrate, paraphenylene diamine, and resorcin.

The beauty washes and face enamels contain an even more impressive array of dangerously potent drugs, including: Flake white, or lead carbonate; diachylon, or lead plaster; corrosive sublimate, or mercuric chloride; calomel, or mercurous chloride; white precipitate, or ammoniated mercury; pearl white, or bismuth subnitrate; zinc white, or zinc oxide; Chinese white, or commercial zinc oxide; zinc soap, or zinc stearate.

The first of the above list, the ordinary white lead of commerce, is also known as body white, silver white, Dutch white, French white, London white, Roman white, and China white. It is generally recognized as the most common cause of industrial lead poisoning, the prevention or possible abolition of which is attracting the attention of scientists in all parts of the world. No less than 15 states have enacted laws requiring the systematic reporting of occupational intoxications, and in an even larger number of states laws are in force which are designed to prevent, or at least to reduce, the number of cases of industrial poisonings.

Despite the amount of time that has been devoted to the study of industrial poisons, our knowledge of the various problems involved is even now incomplete, and the ultimate effect of the subacute or chronic form of poisoning by salts of the heavy metals on the morbidity and mortality of those afflicted is as yet a fertile field for investigation. Enough is known, however, to show that the list of industrial poisons is a long one and that the various salts of the heavy metals are among the more harmful of these many poisons.

To the toxicologist it must appear strange that, notwithstanding the fact that the toxicity of the so-called heavy metals and their salts is well recognized, many of these substances are offered and are widely sold as cosmetics with the claim that the preparations containing them are absolutely harmless.

The absorbability of the salts of the heavy metals and their toxic properties when absorbed have been known for many years. It has also long since been recognized that females are more susceptible to plumbism than males. This is thought to be due to the harmful effects of lead upon the blood and the blood-making organs of the body and the greater dependence of females on a normal blood supply. For this same reason, no doubt, young women are more susceptible to plumbism than are those more advanced in years.

In both sexes and at all ages, however, the nature of the injury done makes cases of poisoning by any of the salts of lead difficult to recognize, more particularly as the obtainable history is at times misleading.

Robinson (*Jour. Amer. Med. Assoc.*, 1915, vol. 64, pp. 814-815) reports two cases of lead intoxication due to skin absorption from a cosmetic. He expresses the belief that many cases of general nervous debility, some of insanity, and perhaps some of paralysis are caused by the use of cosmetics containing lead. Many of the vague and little-understood abdominal pains of women are due to this cause, and abdominal sections have been done because of lead colic.

Sante (*Jour. Amer. Med. Assoc.*, 1915, vol. 64, pp. 1573-1574), in reporting two additional cases of lead neuritis from cosmetics, expresses the belief that out of the thousands of girls who use preparations containing lead there must be many cases in which the untoward effects are not readily recognized as being due to lead poisoning and which are consequently overlooked. The relative infrequency with which lead poisoning is diagnosed in women leads one to believe that it must be often overlooked.

Early in the nineteenth century it was asserted that a zinc dyscrasia analogous to a chronic lead poisoning may be produced either by the frequent use of medicinal doses of the agent, by the inhalation of zinc fumes, or by the absorption of salts of the metal through the unbroken skin.

While observers have differed in their opinions regarding the toxic properties of zinc and its salts, it is now definitely established that occupational brass poisoning or brass founders' ague is due to the zinc that is present in the mixture, and that the several salts of zinc may produce a form of intoxication simulating that caused by the salts of lead.

It has been claimed by some that patients suffering from zinc poisoning are even more subject to a general progressive muscular atrophy than are those suffering from lead poisoning, and that the gastro-intestinal symptoms as well as the nervous symptoms are equally severe.

Acute, subacute, and chronic poisonings by the several salts of mercury are more readily induced than are the corresponding intoxications by lead and zinc. Salivation, accompanied by torturing cramps and nausea, has been caused by the local use of calomel and other insoluble salts of mercury and also by weak solutions of mercuric chloride.

Hydrargyria, or mercury intoxication, begins usually with salivation, accompanied by redness and swelling of the gums, and is followed by stomatitis, diarrhoea, and a marked disturbance of the central nervous system.

The very common occurrence of mercuric chloride or corrosive sublimate in the moth and freckle lotions sold at the present time is deserving of special attention.

Mercuric chloride is an efficient local irritant, and properly used will destroy the outer layer of the skin, and in this way remove moths and freckles. It is, however, as noted above, also a systemic poison that may be absorbed through the unbroken skin in sufficient quantities to cause a chronic, or even a subacute, form of mercurial intoxication. Used on an open sore or on abnormal skin, it may cause acute and even fatal poisoning.

The insoluble salts of bismuth were long supposed to be comparatively innocuous, but their more recent use in connection with X-ray examinations of fistulous tracts has shown that they may have toxic properties.

When insoluble bismuth salts are brought into contact with open wounds soluble compounds are produced that are toxic in character, producing symptoms similar in nature to those characteristic of mercurial intoxication.

Tuttle (*Med. Rec.*, 1884, vol. 25, p. 258) reports having come in contact with five cases of poisoning by cosmetics, in which the toxic agent was undoubtedly an insoluble salt of bismuth. The characteristic symptom was clamminess of the skin, accompanied by nausea and spasms, differing in degree only from those of lead, mercury, and zinc.

Even the salts of magnesium are not without possibilities for harm. Meltzer and Auer have shown that when introduced into the circulation, magnesium salts are highly toxic and may produce kidney lesions, as well as profound respiratory disturbances, and even death, in warm-blooded animals. Whether or not these substances can be absorbed through the unbroken skin has as yet not been demonstrated. but the use of insoluble compounds of magnesia in dusting powders on open wounds or broken skin is not to be recommended, nor is the long-continued use of any of the now widely-advertised lotions containing magnesium sulphate or Epsom salt advisable.

The latter preparations serve very well to show the gullibility of that portion of the public that is desirous of improving its facial

appearance. As Epsom salt, magnesium sulphate can usually be purchased for 5 cents a pound, while in the form of any one of the popular skin or wrinkle lotions it is sold at the rate of from \$2 to \$4 a pound.

Paraphenylene diamine is an aniline derivative, which by oxidation becomes black or brown. The poisonous qualities of this chemical are well known. A number of cases of poisoning from the use of the compound as a hair stain and even from wearing hose dyed with this chemical have been reported.

Resorcin is one of the frequently occurring constituents of hair tonics. In common with other coal-tar derivatives, it is highly toxic, because of the production of methæmoglobin. Some persons are particularly susceptible to its influence, and many cases of collapse and even death from the external use of resorcin are on record.

In conclusion it may be worth while to quote from some of the published analyses of cosmetics to demonstrate the dangerous character of many of these preparations and the fraudulent nature of others.

More than 40 years ago (AMER. JOUR. PHARM., 1870, vol. 42, p. 362) C. F. Chandler, in a report, stated that of 16 hair tonics, washes, and restoratives analyzed 15 contained lead, generally in the form of acetate; the remaining preparation contained silver nitrate. Of the sixteen preparations reported on by Chandler in 1870, eight are still sold and two were recently examined by Street (Rep. Connecticut Agric. Exper. Sta., 1914, pp. 281-291). One of these preparations now contains approximately twice the amount of lead found by Chandler, and the other has been converted into a sulphur-containing preparation with the active ingredients enumerated on the label. Of the remaining four hair restorers examined by Street, two contained lead, one silver nitrate, and one paraphenylene diamine, the poisonous coal-tar dye referred to above.

Chandler, in the report previously quoted, states that of six lotions or washes examined, only one contained lead or other injurious metals. This preparation, a moth and freckle lotion, contained both mercury and zinc and is still being sold. Street, in the more recent report, found that out of seven preparations for the removal of freckles, four depended chiefly on the action of mercuric chloride, one contained mercuric chloride and lead, and two contained ammoniated mercury or white precipitate.

Chandler, in 1870, found that three of the seven face enamels

examined at that time contained zinc oxide, three contained lead carbonate, and one calcium carbonate. Tuttle (*Med. Rec.*, 1884, vol. 25, p. 257) found that three of the eight face enamels examined by him contained lead carbonate, one contained calomel, two contained zinc oxide, and two contained zinc oxide and calcium carbonate.

It may be said that many of the so-called beauty lotions and toilet powders are primarily fraudulent in that their efficiency may be questioned, and the retail price of any one of this type of preparation is out of all proportion to the actual value of its components. Thus Street, in the recent Report of the Connecticut Agricultural Experiment Station, enumerates no less than five preparations for the removal of wrinkles which were found to consist chiefly of commercial Epsom salt.

An even more recent illustration of deliberate fraud practised in connection with the sale of toilet powders is to be found in a paper by C. H. LaWall (*AMER. JOUR. PHARM.*, 1915, vol. 87, pp. 293-299). Of sixteen samples of rice powder examined, but two were genuine and only six contained rice starch at all. In eight of the samples, corn starch was used in place of the more expensive rice starch, and in two samples no starch of any kind was present, the constituents being wholly of a mineral origin. Talc was present in thirteen of the sixteen samples referred to.

The composition of the several samples is well shown by the following table:

Table Showing the Per Cent. Composition of 16 Samples of Rice Powder, or "Poudre de Riz," Examined by LaWall.

Number of sample	Rice flour	Corn starch	Talc	Zinc oxide	Chalk	Bismuth subnitrate
1.....		100				
2.....	50		40	10		
3.....		17	70		13	
4.....		50	25		25	
5.....		7	93			
6.....	25		60	15		
7.....	18		70		12	
8.....			75	25		
9.....		90	7	2		1
10.....		90	7	2		1
11.....		62	38			
12.....			67	33		
13.....		62	38			
14.....	100					
15.....	100					
16.....	50		25	25		

From a study of the available data it may be concluded that—

The poisonous nature of wood alcohol, in all of its several forms, is so well established that its presence in cosmetics or other preparations for external use on the human body should be prohibited by law.

Salts of the heavy metals, particularly salts of lead, zinc, mercury, and bismuth, may be absorbed from cosmetic preparations and produce their characteristic constitutional effects.

Women are more susceptible to these several intoxications than men, and the resulting symptom-complex is more likely to be overlooked or mistaken for a natural physiological disturbance.

Cosmetics, as ordinarily used, tend to clog the pores or irritate the skin and are thus likely to interfere with the normal, healthy action of that organ.

To prevent serious intoxications and to preclude obvious deception and fraud, cosmetics should be classed as drugs, and proprietary preparations sold as cosmetics should be required to state on the label the name of any poisonous ingredient that may be contained therein.

QUARTERLY REVIEW ON THE ADVANCES IN MATERIA MEDICA AND PHARMACY.

By JOHN K. THUM, PH. G., Pharmacist at the German Hospital,
Philadelphia, Pa.

The Committee on Publication of the *Journal of the American Pharmaceutical Association* has decided, after careful consideration of the subject, that the best interests of the Association will be served if the editorial office be established in the city of Philadelphia. As this city has always been recognized as the centre of medical education, and still holds that proud distinction, and as the same might be said of it from the pharmaceutical standpoint, it being the home of the first and oldest college of pharmacy in the Western Hemisphere, as well as the home of two other colleges of pharmacy of good repute, the environment will be of a kind that cannot help but be of great helpfulness alike to the editor and the committee. Here reside the chairman of the Pharmacopœial Revision Committee and quite a few of its ablest workers. Philadelphia was among the very first to organize a branch of the Association, and the work accomplished by this body has been of vast benefit, not only to the members

thereof, but to pharmacy in general; the commercial as well as the professional side of the calling benefiting by its activity.

On Tuesday evening, January 11, the local Branch held a reception at The Rittenhouse in honor of the editor of the *Journal*, Prof. E. G. Eberle. The large attendance of members and specially-invited guests representative of the medical profession and the business interests of the city, as typified by such organizations as the Chamber of Commerce and the Philadelphia Drug Exchange, and the speeches of welcome delivered by these gentlemen, to say nothing of the warm words of welcome uttered by those who represented the pharmaceutical side of the gathering, surely must have convinced the distinguished guest of the sincerity of the welcome extended to him.

That the larger interests of the City of Brotherly Love appreciate the establishing of the *Journal of the American Pharmaceutical Association* here is clearly evidenced by an editorial that appeared in the *Philadelphia Public Ledger* on January 27. It is as follows: "The transference of the *Journal of the American Pharmaceutical Association* is another straw that shows where the true interests of the trade and profession lie, whether it be in the matter of drugs or their classification or the special education and training as druggists and doctors, whose interests interlock in every way. And as this concentration of interests here, industrial and educational, keeps up it is not too much to expect that the long-hoped-for creation of a great combined school for higher medical research will become a fact. New York, which is after it under the leadership of Columbia University, has not yet landed the prize, and the natural advantages of Philadelphia, with our signal lead as the most important medical centre in the country, with an unsurpassed background, ought to make it possible for this city to win out. With such a school we should not only have all the United States at our doors, but, as every one knows, the steady drift of Central and South America here for medical training would be accelerated; and we should be at the head of advanced work for the entire Western Hemisphere in the study of a preparedness in eliminating disease, reducing suffering, and saving life that would be the glory of the age."

The attempt of interested parties to have the Sherley Amendment to the Food and Drugs Act declared unconstitutional has failed. It will be remembered that this amendment declares a drug mis-

branded if false and fraudulent therapeutic claims are made in reference to it. On January 10 the highest court in the land, the United States Supreme Court, Justice Hughes delivering the opinion, every member of the court having agreed to it, stated: "We find no ground for saying that Congress may not condemn interstate transportation of swindling preparations accompanied by false and fraudulent statements, as well as lottery tickets." Thus closes another chapter in the attempt to weaken a law that has done so much to safeguard the health of the public.

At the Baltimore Branch of the American Pharmaceutical Association, in December, a joint meeting was held with the local retail association, the principal topic of the gathering being the value of advertising. Some of the remarks of the advertising expert, Mr. J. Thomas Lyons, who addressed the gathering, are pertinent, and it may not be amiss to quote them: "It doesn't matter how long you have been in business, you have been advertising from the very first day you opened your door. Every package that leaves your store is an advertisement for you; the clothes you wear; the things you say; the manner in which you treat your fellow-men; the manner in which you walk down the street are all advertisements in the truest sense of the word. . . . Advertising does not necessarily mean bill-boards, street cars, newspapers, blank walls, circulars, programs, letters, or any one specific thing, but advertising means anything that attracts the attention of one person or of a million people to your business or to you personally as the proprietor of that business, and if the retail druggist could only realize that almost every waking hour he is advertising or *mis*-advertising his business, he would pay some attention to the importance of correct advertising." The kernel in the nut is the word "correct," and to be able to advertise correctly a man must be efficient, and his whole environment and every action must be such as to give that impression to those whom he would reach.

The *Journal of the American Pharmaceutical Association* for January contains the entire address of Mr. Lyons and is well worth a perusal.

The *Journal of the American Medical Association* contains an article on "The Nature of Pharmaceutic Naphthene Oil (Liquid Petrolatum)," by Benjamin T. Brooks, Ph.D., Pittsburgh, Pa., which is of considerable interest. It gives the sources of liquid petrolatums, their composition and the various types, and offers a suggestion on

the need of a proper and uniform nomenclature. In the same number of the *Journal*, under "Current Comment," the advisability of changing the name of this oil is deprecated, there being no good reason advanced for such a change. The comment of the *Journal* is decidedly interesting, and we give it in its entirety: "What is Liquid Petrolatum? The use of liquid petrolatum in chronic constipation, which has recently become the vogue, has naturally been commercialized; as a result, also naturally, claims of superiority of one brand over another have been made. Some of these claims have been well founded; others certainly are not. Some have claimed superiority for those products made from Russian oil over those made from American oils. As naphthene hydrocarbons predominate in Russian crude petroleums, and paraffin hydrocarbons in many or most American crude petroleums, it was assumed that the petrolatums derived from these sources differed from each other in like manner. Both the naphthenes and the paraffins are chemically inert; but some unexplained therapeutic superiority has been assumed to reside in the naphthenes. Consequently, it has been urged that the American liquid petrolatums should not be used internally. So far these claims and counter-claims have been based on much theory and little fact. The *Journal* publishes this week a contribution by Benjamin T. Brooks, Senior Fellow in charge of petroleum investigations at Mellon Institute, Pittsburgh. Brooks calls attention to the fact that Marcusson, in 1913, pointed out that most of the so-called mineral oils used for therapeutic purposes contain no paraffin hydrocarbons whatever; that they consist solely of naphthenes and polynaphthenes. Brooks confirms this statement so far as American liquid petrolatums are concerned. He states that many American petrolatums, such as most of those from the Gulf region, are like the Russian in containing no paraffin; and that, in the case of those petroleums that do contain it, the customary refinery method of removing paraffin is sufficient to produce true naphthene and polynaphthene petrolatums. 'The claim that only Russian oils belong to this class,' he says, 'has no basis in fact and has been advanced presumably for business reasons.' The name 'paraffin oil' applied to these liquid petrolatums, then, is a misnomer. The new name, 'white naphthene oils,' suggested by Brooks, seems superfluous, however, since the pharmacopœial title, 'liquid

petrolatum,' is subject to no such objection." (*Journal of the A. M. A.*, January 1, 1916.)

CHEMISTRY AND PREPAREDNESS.—Under the foregoing title the *Philadelphia Public Ledger* gives recognition to the immense value chemistry plays in our modern civilization. It may not be amiss to quote this brief editorial: "Civilization has been defined as a mere matter of chemical output. Primitive peoples know little of chemistry or its products; some distillation and a little metallurgy suffice for their needs, and their chemical imports or exports are negligible; and all the uncivilized peoples of to-day, such as Morocco, are in the same boat. But with the great civilizations things are entirely different, even if it be but a matter of soap, one of the fundamental chemical preparations, whose use and production are said to indicate more clearly than anything else the precise place in the scale of advancement at which any nation may have arrived. And if Germany be taken as the standard of military preparedness, it is also at the very top in the greater issue of chemical preparedness, on which all the arts and industries rest.

"Consequently the plans that have been proposed to make the Graduate Engineering School of Columbia University a great research centre for chemical studies are not only worth while putting into effect there, but also call for imitation everywhere. Industrial efficiency means in every case chemical efficiency; and if we are to organize our resources for the future, the first thing necessary is to insure our chemical independence, and it cannot come too soon. Germany found out it could not do without the professor, especially professor of chemistry, and no more can we." (Editorial, *Philadelphia Public Ledger*, December 27, 1915.)

DIGITALIS MEDICATION.—The following report of the Council on Pharmacy and Chemistry of the American Medical Association in reference to the question of digitalis medication is timely. At the present time the medical profession is being flooded with the output of many manufacturers, each claiming for his particular product marvellous advantages; these wonderful and astonishing advantages somehow fail to materialize, and the doctor goes back to the freshly-prepared infusion and a tincture prepared by his most reliable neighboring pharmacist. And the thoughtful doctor will always see that that type of pharmacist, and no other, does the dispensing for his patients: "Proprietary Digitalis Preparations," Report of the Council on Pharmacy and Chemistry.

The Council has authorized publication of the following expression of its views.

W. A. PUCKNER, *Secretary*.

"It is becoming increasingly apparent that the tincture of digitalis produces the full therapeutic effects of digitalis, and that when it is properly made it is as stable as any liquid preparation of digitalis now available; and that the tincture has the systemic side actions of digitalis, including the emetic, in no greater degree than the various proprietary preparations of this drug to be found on the market.

"While in itself the market price of a valuable therapeutic agent is of comparatively little moment, the fact remains that the price at which many of the proprietary preparations are sold—often 100 times that of an equivalent amount of the drug—serves as a constant stimulus to the exploitation of these extravagant claims, and it is commonly sought to enhance their reputation by exaggerating the disadvantages of the official drug and its preparations.

"The Council especially emphasizes the fact that this statement is not intended to lessen the efforts that are being made to find new and better preparations of digitalis; its protest is against the deliberate misrepresentations of those manufacturers who seek to magnify the difficulties in the use of digitalis, by therapeutic exaggeration on the one hand, and by an exaggeration of the side actions of digitalis and the instability of its preparations on the other.

"Strophanthin and crystalline ouabain are now available in sterile solution in ampoules, and afford a convenient means of promptly securing the cardiac action by intramuscular or intravenous injection." (*Journal of A. M. A.*, December 4, 1915, p. 2024.)

THE STABILITY OF THE INFUSION OF DIGITALIS.—It always has been taken for granted that the galenical preparations of digitalis, and particularly the infusion of digitalis, are very prone to deteriorate. It is doubtful if this is true of preparations made with a menstruum of 60 to 75 per cent. alcohol, but it is assuredly so of the infusion of digitalis. Many physicians have had it proved to them clinically. The writers of this paper, however, state that, while there is undoubtedly deterioration, this does not take place as rapidly and readily as commonly believed. Their method of proving this was to test the infusion when freshly made, and at intervals after having been subjected to various conditions, such as exposure to air, changes of temperature, and contact with infected organic matter, by its activity on cats. This method is known as the cat-method, and

was originated by one of the writers. It is essentially the injection of the test-preparation slowly and continuously into the vein of a cat until death results. Mention is made that the official direction to make the infusion by exhausting the bruised leaf is inadequate. We hope that the Revision Committee of the Pharmacopœia has taken steps to correct this. (At the German Hospital, Philadelphia, the powdered drug has been used for years in making the infusion.) They made their infusion by infusing the powdered drug on a water-bath at 95° C. for an hour. While they admit that the infusion is not a stable preparation, yet it is no more so than other vegetable infusions; the long-standing opinion that it is especially unstable is not borne out by their experiments. Their conclusions are as follows: (1) The infusion of digitalis is fairly stable when prepared and kept with ordinary care, no important change then occurring within a week. (2) The addition of alcohol to the infusion is unnecessary. (3) Old, and even mouldy, digitalis and its infusions may give the typical digitalis actions qualitatively so long as they retain any considerable degree of activity. (4) A properly-made infusion of digitalis represents the leaf practically in its entirety, the action being qualitatively like that of the tincture. (5) Owing to the variability in the activity of the infusion as it is commonly obtained, the tincture should be preferred to it in therapeutic practice. (By Robert A. Hatcher, M.D., and Cary Eggleston, M.D., *Jour. A. M. A.*, November 27, 1915, p. 1902.)

NITRIC ACID FROM AIR.—According to statements appearing in the daily newspapers, plans are well under way for the manufacture of nitric acid from nitrogen extracted from the air. James B. Duke, one of the officers of the Southern Electro-Chemical Company, is quoted as saying that his company will be able to market this important and necessary acid by the 1st of January. Mr. Duke's company expects to turn out four tons of nitric acid daily from its works at Great Falls, S. C. The same work will very likely be carried on in Canada by the Quebec Development Company, of which Mr. Duke is the president.

The above announcement is very encouraging and makes one feel hopeful that the people of this country are awake to the necessities arising because of the terrible conflagration taking place in unhappy Europe and other parts of the world. Just a few weeks ago Brigadier-General William M. Crozier, chief of ordnance of the United States Army, in his annual report, strongly recommended that

the nation take steps to be independent of the Chilean beds for the nitrates used in the manufacture of gunpowder, and touched upon this very question of fixation of nitrogen from the atmosphere. Its value from the standpoint of military necessity cannot be gainsaid, but from the larger economic question of the development of agriculture and industry in general its value can hardly be overestimated.

PRINCIPLES UNDERLYING THE USE OF VACCINES, BACTERINS, ANTITOXINS AND IMMUNE SERUMS AS AGENTS FOR THE PREVENTION AND CURE OF INFECTIOUS DISEASES.—As the title will no doubt indicate to most readers, this paper is a most comprehensive handling of a side to the treatment of disease to which many pharmacists are more or less a stranger. As the pharmacist is looked to by the doctor as the distributor, not only of the orthodox style of medication, but likewise of all the various biological preparations that are coming into vogue, it behooves the up-to-date pharmacist to become familiar with this class of preparations. This paper was read before the Scientific Section at the last meeting of the American Pharmaceutical Association. The first of a series of three instalments appears in the December issue of the *Journal of the American Pharmaceutical Association* and contains all the latest knowledge of that interesting branch of medicine: knowledge that the progressive pharmacist really cannot do without. (*Journal of A. Ph. A.*, December, 1915, p. 1440, by F. E. Stewart, Ph.G., M.D., Phar.D.)

STABILITY OF PREPARATIONS CONTAINING YELLOW PHOSPHORUS.—Methods of assay are given to determine the amount of phosphorus remaining in various pharmaceutical preparations examined from time to time. It was found that preparations with phosphorus as part of their composition kept rather well under ordinary conditions. Those preparations that contain vegetable matter are more readily decomposed. A tabulation is given which shows that elixir of phosphorus, and combinations of phosphorus with nux vomica and likewise with damiana, keep well for about five months; after that time a rather quick dissipation of the yellow phosphorus takes place. (*Jour. A. Ph. A.*, December, 1915, p. 1451, by H. Engelhardt and O. E. Winters.)

SEMPERVIRINE FROM GELSEMIUM ROOT.—Further results are given in reference to the separation of this alkaloid from a mixture of alkaloids, or, to be more correct, a mixture of the total alkaloids from gelsemium. Concise information is given as to the best way to isolate the drug and to prepare some of its salts. It is also brought

out that gelsemium root contains two alkaloids. How to separate the various alkaloids is clearly stated, and the results of some preliminary biological experimenting on the action of sempervirine show that the salt apparently has no immediate toxic effect, although the toxicity of this drug is proved. (*Jour. A. Ph. A.*, December, 1915, p. 1458, by A. E. Stevenson and L. E. Sayre.)

COLOR REACTIONS.—Color tests made on thirty-five alkaloids and eighteen other organic compounds give convincing evidence that there is a wide difference in the shades of color produced by given reagents. Among some of the conclusions arrived at is the great difference in the sense of vision and the ability or lack of ability to distinguish different shades and colors on the part of different individuals. Impurities in the compounds under investigation and the reagents used to determine their identity are also most important factors. The advisability of using only freshly-prepared test solutions is also suggested, and the amount of the reagent to be added to the substance under examination is likewise important. In brief, this paper impresses one as to what every chemist should know and practise—care and thoughtfulness in his work. (*Jour. of the A. Ph. A.*, December, 1915, p. 1467, by E. A. Ruddiman.)

QUICKSILVER.—According to the *Pharmaceutical Journal and Pharmacist* of London (November 20, 1915, p. 658), a deposit of mercury is being prospected near Thames, in New Zealand. It is asserted that a high-grade ore has been secured and forwarded to Sydney. Experts who have examined the deposit are very much impressed with the possibilities of this find.

CAFFEIN.—It may be of interest to know that this drug is being manufactured on a commercial scale in Japan. Further development of this industry, it is hoped, may result in the exporting of this drug. It is stated that before the outbreak of the war there had been a regular business of exporting from Japan tea sweepings, which were bought mostly by German firms. It is very probable that these were used for chemical manufacture. The Japanese, with their customary alertness, are now buying up all the tea sweepings themselves and making all the caffein they need. (*The Pharmaceutical Journal and Pharmacist*, November 20, 1915, p. 20.)

VARIATIONS IN THE ALKALOIDAL CONTENT OF BELLADONNA.—The Department of Agriculture reports the result of some experimental work having for its object the determination of the conditions which influence the alkaloidal content of this important plant.

It is shown that the first-generation plants secured from seed of cross-pollinated selected individuals display the characteristic of the maternal parent with regard to alkaloidal productivity. This condition is generally true for at least two seasons. (A. F. Sievers, Bulletin No. 306, U. S. Department of Agriculture, 1915.)

BRAZILIAN JALAP.—It is evident that Brazilian jalap has been imported into Germany for some time as a cheap source of jalapin; *i.e.*, the resin of jalap insoluble in ether. An examination of this Brazilian root disclosed that it contained over 20 per cent. of resin, which certainly comes up to both the B. P. and U. S. P. requirements for the resin of true or Vera Cruz jalap, but only 0.85 per cent. of the resin is soluble in ether. As a source of jalapin (resin of jalap insoluble in ether) it is therefore twice the value of the Vera Cruz jalap, since it contains twice the standard of resin required by the B. P. While it is a fact that it contains a little more ash than the Vera Cruz jalap, this does not lessen its value as a source of jalapin. (*The Pharmaceutical Journal and Pharmacist*, November 27, 1915, p. 671, by E. M. Holmes.)

PREPARATION OF ETHYL BROMIDE.—Text-book methods for making this chemical are unsatisfactory in the following respects: (a) A large excess of alcohol is used, giving a yield of less than 50 per cent. of ethyl bromide on the alcohol used; (b) the formation of ether owing to (1) the large excess of alcohol used, and (2) the high temperature used in the reaction; and (c) the use of potassium bromide instead of the less expensive sodium bromide. It is suggested that by using (1) molecular proportions by weight of absolute alcohol, sulphuric acid (sp. gr. 1.84), and sodium bromide; (2) water (5 to 10 per cent. of the weight of alcohol taken); (3) excess of sulphuric acid to the extent of 5 per cent. of the theoretical weight required, and paying attention to the rate of heating the reaction mixture, a minimum yield of pure ethyl bromide of 80 per cent. of the theoretical on either the alcohol or the sodium bromide can be obtained. With special care the yield may be increased to 90 per cent. It is possible to obtain these yields without the formation of even a trace of ether, thus obviating loss of time and material in purifying the crude product. (*The Chemist and Druggist*, December 4, 1915, p. 52.)

SCHIMMEL'S REPORT.—Commenting on the recent report issued by this enterprising firm that never seems to forget the scientific aspect of its industry, the *Chemist and Druggist* has this to say: "The report indicates with much satisfaction that the absence of

German supplies is sorely felt in neutral and hostile countries, and in fourteen months foreign competitors of German essential-oil makers have not succeeded in improving their products so as to become serious competitors in the world's markets. A comparison between the prices that have to be paid for essential oils and perfumes on the German and on foreign markets clearly indicates that prices on the latter have reached 'unimaginable heights.' Enemy countries, especially England, try to get German dyes from neutral countries, and the extreme prices that are paid show clearly enough how scarce they are in these countries. The threatenings that have so often been uttered in the hostile press, that after the war Germany will be entirely supplanted by England in the world's markets, need not be taken seriously, at least not with regard to perfumes and essential oils. No ostrich policy can hide the fact from Germany's enemies that a successful trade war against Germany is impossible, notwithstanding the measures that have been taken." (*The Chemist and Druggist*, December 11, 1915, p. 39.)

ESTIMATION OF ATOXYL.—Six different methods for the estimation of the percentage of arsenic in atoxyl are known to chemists. They are (1) sulphurous acid method, (2) the method proposed by Norton and Koch for estimating arsenic in the presence of organic matter in a modified form, (3) the method of the German Pharmacopœia, (4) method of the German Pharmacopœia modified, (5) W. Dulliere's method, (6) Bougealt's hypophosphite method. The authors of this paper give the details of the technic used by them in working out these various methods and the results obtained. All the methods used gave fairly concordant results with the exception of the sixth, which the investigators deem absolutely unreliable. Although nothing new is brought out by the work accomplished by the authors, it was shown that modification of the German Pharmacopœia method gave the best results. (*Journal of A. Ph. A.*, December, 1915, p. 1468, by H. Engelhardt and O. E. Winters.)

TINCTURES.—A number of pharmacopœial tinctures were made from the crude drug and from the dilution of fluidextracts with the end in view of noting if there might be any difference in the stability of each series. While the author seems to make out a good case for diluted fluidextracts, in fact, he even goes so far as to say that the stability of those made from fluidextracts is "fully as good, if not better," we cannot help but feel that a pharmacist who makes his tinctures in such a manner is practising anything but pharmacy.

Why go to all the trouble of acquiring a pharmaceutical education if the end of it all is to be a mere distributor of the products put out by the large manufacturing pharmaceutical houses? (*Journal of the A. Ph. A.*, December, 1915, p. 1472, by Wilbur L. Scoville.)

THE ESTIMATION OF MORPHINE IN PILLS AND TABLETS.—Various compound solvents are given for extracting morphine, all of which can be used with more or less success, but the writer has found that a mixture of one part of alcohol and two of chloroform by volume, as suggested by Williams, can be used with very good results. His method of determining morphine is the transformation of the morphine into an acetyl derivative, extraction with chloroform, and finally titration with standard acid. His method for overcoming the presence of the various diluents used in the manufacture of pills and tablets, in his estimation of morphine, in such dosage forms, is given in detail and is eminently practicable. (*Journal of A. Ph. A.*, December, 1915, p. 1477, by H. W. Jones.)

AUROCANTANE.—This is stated to be a double cyanide of gold and cantharidylethylenediamine, to which the formula $C_{10}H_{12}O_3NCH_3-C_2H_4NH_2HCN.AuCN + H_2O$ is attributed. It is a white crystalline powder, soluble in alcohol and water, and is stated to be of value in tuberculosis. It is recommended to be given hypodermatically in doses beginning at 25 mg. twice a week, and gradually increased until the patient is getting in the neighborhood of between 50 and 70 mgms. The solution should be sterilized and made so that each mil contains 25 mg. (*J. Pharm. Chim.*, 1915, 12, 323, through the *Pharmaceutical Journal and Pharmacist*, December 18, 1915, p. 761.)

ILLINOIS PURE FOOD LAW UPHELD.—The Supreme Court of the United States has upheld the decision of the Supreme Court of the State of Illinois, which held that the Illinois Pure Food and Drugs Act, which prevents the sale of anything containing "any added poisonous or other deleterious ingredient which may render such article injurious to health," is constitutional. One of the things held to be injurious under this statute is boric acid. A dealer who was convicted of selling a preservative for canned fruit and vegetables which contained boric acid contended that the merchandise sold was not a food and that it had not been proved unwholesome or injurious. The state court very wisely took the view that the law was broad enough to prohibit the sale of any preservative for food that contained boric acid. This decision has just been confirmed by the

Supreme Court of the United States. (*Jour. A. M. A.*, January 22, 1916, p. 282.)

STRONTIUM SALICYLATE.—It is claimed that there is no satisfactory reason for the therapeutic reputation that this salt has enjoyed for so long except the statements of manufacturers. The literature on the pharmacology of this drug is scant. A careful examination of the effects of the drug from a clinical standpoint was undertaken by the writer on a number of cases at the Lakeside Hospital, Cleveland, who summarizes as follows:

1. The mean toxic dose of strontium salicylate is the same as that for sodium salicylate.
2. Strontium salicylate produces the same gastric symptoms produced by any salicylate.
3. It is no more effectual in relief of pain.
4. It is not so convenient to give as are the more soluble salicylates. (*Jour. A. M. A.*, January 29, 1916, p. 332, by M. A. Blankenborn, M.D.)

A *PENICILLIUM* WHICH PRODUCES OXALIC ACID.—A new *Penicillium* has been discovered that produces oxalic acid from many carbonated media, such as those containing cane-sugar, lactose, potato starch, or peptone. The organism has been named *Penicillium oxalicum*, and is the only mould of the genus *Penicillium* hitherto known to form oxalic acid. It is said that when carbonate of lime is added to the medium the mould grows less vigorously, but the yield of oxalic acid is greatly increased, and it may attain to 40 per cent. of the weight of sugar present. It also is said that the acid is not the end product of the biochemical action of the mould; after from eight to ten days the amount formed reaches a maximum, and then diminishes in quantity. (*Jour. Biolog. Chem.*, Chem. Abstr., 1915, 9, 3083, J. N. Currie and C. Thom.)

ALIVAL.—A new compound of iodine, organically bound up, is going the rounds under the euphemistic name of Alival! Will the use of coined names never cease? It is supposed to be the result of the action of chlorhydrin on an alkali iodide. It appears as white, silky needles, with a bitter taste, soluble in water, alcohol, and ether, less soluble in benzene and chloroform. Melts at 48° to 49° C. Given in cases in which iodine is indicated. It is claimed that, while the absorption of this drug is less rapid than other combinations of iodine, it is more regular and without untoward effects. (*J. Pharm. Chim.*, 12, 324, 1915.)

CORRESPONDENCE.

WHISKY AND BRANDY IN THE U. S. PHARMACOPŒIA.

The January meeting of the City of Washington Branch of the American Pharmaceutical Association was held at the National College of Pharmacy on the evening of January 26, 1916.

The need for including whisky in the Pharmacopœia was discussed at some length in connection with the following preamble and resolutions, which, after a free discussion, were unanimously adopted:

WHEREAS, It is proposed to delete whisky and brandy from the Pharmacopœia of the United States of America, because of the difficulties involved in devising equitable standards and readily applied tests; and

WHEREAS, The standards and tests heretofore included in the Pharmacopœia did not guarantee an article of unquestioned purity, and

WHEREAS, It is practically impossible to control, or to determine the purity of whisky and brandy by chemical means alone; and

WHEREAS, The Government of the United States (for whisky) and the Government of France (for brandy) provide adequate means for securing these products of unquestionable purity and readily controlled quality; now therefore be it

Resolved, That we, the members of the City of Washington Branch of the American Pharmaceutical Association, recommend that American pharmacists who are willing or anxious to supply whisky or brandy of good quality, for medicinal purposes, become acquainted with the existing provisions for securing these products of unquestionable identity and of reasonable purity; and be it further

Resolved, That we, the members of the City of Washington Branch, endorse the proposed deletion of so-called standards for whisky and brandy from the Pharmacopœia of the United States of America.

Mr. Bradbury, in opening the discussion, said it would be interesting to know who really was the instigator of the agitation to include whisky and brandy in the Pharmacopœia. He felt sure that such a move did not come from the legitimate drug trade, as in sections of the country, like the District of Columbia, where druggists were not allowed to sell whisky, the drug trade would be loath to have the responsibility for the sale and distribution of whisky forced back on its hands.

Mr. Richardson said that from his experience prescriptions for

whisky are extremely rare and would certainly not warrant the including of whisky or brandy in the Pharmacopœia.

Dr. Harvey W. Wiley reviewed the recent six-year controversy over whisky in the Pharmacopœia, and expressed himself as being heartily in favor of the resolutions as presented. He asserted that the requirements included in the U. S. P. VIII and the requirements, as outlined in a recent number of the *Journal of the American Pharmaceutical Association* (see also this JOURNAL, p. 49), which had been proposed for inclusion in the U. S. P. IX, would not suffice to detect adulterated or sophisticated whisky or brandy.

For the retail druggist who is willing to handle absolutely pure whisky and brandy for medicinal purposes the provisions made by law are ample. Dr. Wiley expressed the belief that the nature of these provisions might be explained so as to point out to well-meaning pharmacists how they might safeguard themselves and their customers. For whisky the double-stamp or bottled-in-bond product is guaranteed by the United States Government to comply with the statement made on the strip label over the cork of the bottle.

While it is true that this label does not in any way guarantee the composition of the original distilled spirits, there are economic reasons for accepting the label as a guarantee of quality.

It would not be likely to pay a distiller to have money tied up in a bonded warehouse unless he were reasonably sure of finding a ready market for his product when it is ready for sale.

For brandy the provisions made by the French Government in connection with the now well-known white certificate or "*Acquite Blanc*" are even more comprehensive. This certificate guarantees a genuine product made from a good quality of wine, and this is, so far as Dr. Wiley knows, the only form of brandy fit for human use. American brandies, so far as known, are vile concoctions made from fermented mixtures of sugar and pomace or the distillation of so-called "sick wines," many of them very sick and unfit for use.

With these additional suggestions as to how the retail druggist can secure a good quality of whisky and brandy, Dr. Wiley thought the resolutions quoted above would be timely and of value to the drug trade, particularly in view of the fact that he had just learned from the Chairman of the U. S. P. Committee of Revision that the proposition to reconsider the vote to delete whisky and brandy had been voted down by a decided majority of the members of the committee, despite the fact that several members who had previously voted for

deletion had also voted for reconsideration. This vote, he believes, definitely disposes of whisky in the Pharmacopœia, and the publication of the U. S. P. IX will now proceed unhampered by vexatious questions of policy.

S. L. HILTON, *Secretary*.

CORRESPONDENCE COURSE IN HOME SANITATION AND THE PREVENTION OF DISEASES BY THE EXTENSION DIVISION OF THE
UNIVERSITY OF CALIFORNIA.

The Bureau of Correspondence Instruction of the University Extension Division of the University of California has just completed the arrangements for giving a correspondence course in Home Sanitation and the Prevention of Disease which is open to the general public. The course is arranged by Dr. Albert Schneider, of the College of Pharmacy of the University of California. It is believed that this course is of special value and interest to pharmacists. It gives instruction as to what is meant by health and disease and how to prevent disease, and is divided into two parts, as follows:

1. The Home and its Environment as Related to Health and Disease. This course deals with the home as the family unit and with such matters as sanitary home building, water supplies, disposal of waste, and the destruction and avoidance of the various carriers of disease. This course consists of fifteen lessons, supplemented by assigned reading in carefully-selected text-books. This is introductory to Course 2, but may also be taken separately.

2. Diseases and Their Prevention. This course treats of communicable diseases (the so-called infectious and contagious diseases), their cause and their prevention. The carriers and the disseminators of disease are discussed, as are also the available means for protecting the home and the individual against the agencies which cause disease. This course also consists of fifteen lessons, supplemented by assigned reading in carefully selected reference works.

The fee for each course is \$5. The books required for Course 1 cost \$5.41. The books required for Course 2 cost \$4.06. The total expense for the two courses, including the required books, is \$19. There are regularly assigned lessons which are sent out to the student and which he is required to study diligently in connection with the assigned reading.

Address all communications to University Extension Division, University of California, Berkeley, California.

DOPE LAW REDUCES SALE OF NARCOTIC DRUGS 80 PER CENT.

The question as to whether the Legislative Committee of the Pennsylvania Pharmaceutical Association shall have a bill drafted providing for state anti-narcotic regulation to supplement the Harrison federal act and afford still further protection to the public will doubtless come up for discussion at the annual meeting at Reading this year, especially in view of the statements recently made in the newspapers that the number of drug *habitué*s has not decreased.

Declarations have been made by the jobbing and manufacturing interests, through whose hands these narcotic drugs originally pass, that the total amount imported and sold has been reduced about 80 per cent.; therefore the conditions referred to must be local and not general.

As the Pennsylvania Pharmaceutical Association was prominently identified with the passage of the Pennsylvania Cocaine Law of 1909, one of the forerunners of the Harrison Act, and has energetically worked for years to aid in the passage of federal legislation, it gives the members much satisfaction to learn from the First Annual Report of the Internal Revenue Commissioner on the administration of the Harrison Act that out of 52,187 druggists registered in the United States under this act, only 216 violations of the law are reported, and most of these were of a technical character and not violations of the spirit of the law.

These figures show that over 99.6 per cent. of pharmacists are found to be complying with a law which, so far as they are concerned, is full of hardships, pitfalls, and arbitrary requirements. For instance, it is perfectly legal and proper to sell over the counter to any customer certain household remedies or medicines containing minute amounts of narcotic drugs too small to become habit-forming and specifically permitted by the exemption clauses of the act, but if a prescription is presented calling for any quantity, however small, of one of these preparations compounded with another medicine, that prescription is subject to all of the restrictions which a really habit-forming prescription calls for and therefore cannot be renewed.

The multitudinous records and reports and the extraordinary care which must attend all handling of narcotic drugs fall with greater force upon pharmacists than upon physicians.

As the primary object of the law is the benefit of the public, and as reports show that this object is being achieved, there is no disposition on the part of pharmacists to do more than protest against such inconsistent rulings as that of Treasury Decision No. 2213, the practical effect of which is explained above. The ruling should either be modified or withdrawn, or else all exemptions should be abolished. As the latter would necessitate the amending of the law itself, it would seem more practical to modify the ruling.

PUBLICITY COMMITTEE,
Pennsylvania Pharmaceutical Association.

BOOK REVIEWS.

SUPPLEMENT TO THE BRITISH PHARMACEUTICAL CODEX, 1911, including additions, alterations, and corrections. Published by direction of the Council of the Pharmaceutical Society of Great Britain, London. The Pharmaceutical Press, 17 Bloomsbury Square, W. C., 1915. Price, one shilling net.

This pamphlet of 75 8vo pages contains particulars of important additions and alterations which have become necessary since the work was published, and includes new monographs, galenical formulas, a list of substances with proprietary names and their chemical equivalents, a list of alterations in the text of the British Pharmaceutical Codex, 1911, necessitated by the publication of the British Pharmacopœia, 1914, a list of British Pharmaceutical Codex, 1911, Corrigenda, and an index of nine three-column pages containing upward of 1300 references, and indicating the varied nature and comprehensiveness of the material discussed in the pamphlet under review.

The list of substances with proprietary trade names and their chemical equivalents embodies an attempt to develop and systematize a series of short non-proprietary names by the adoption, so far as possible, of the following rules:

Alkaloids and other basic substances to have names ending in "*-ine*."

Local anæsthetics, if basic in nature, to have names ending in "*-caine*."

Antipyretics to have names ending in "*-in*."

Hypnotics to have names ending in "*-al*."

Antiseptics, for external use, to have names ending in "-form."

On the basis of this proposed system a number of non-proprietary names have been coined for synthetic chemicals of a proprietary nature. Unfortunately many of these names appear to contain but a remote suggestion to the chemical name or composition of the article, and bear practically no resemblance to the advertised proprietary name by which the article is known or used. The coined non-proprietary name at best will find but limited use, and there may be some reasonable doubt as to the propriety of adding to the existing confusion by coining additional names.

If manufacturers could be induced to follow some reasonable system as the basis for new compounds, much might be accomplished in the way of developing a more rational nomenclature for new remedies of a synthetic nature.

M. I. W.

THE RAT. Reference tables and data for the Albino rat (*Mus norvegicus albinus*) and the Norway rat (*Mus norvegicus*), compiled and edited by Henry H. Donaldson, Philadelphia, 1915.

Dr. Donaldson, Director of the Wistar Institute of Anatomy, has brought together in one of the memoirs of the Wistar Institute of Anatomy and Biology the physical characters of the rat in the form of reference tables and data. This animal possesses many advantages for use in biological work, and has been the subject of much study, particularly by investigators in this country. As a result there has been gathered a considerable number of data applying to the weight and size of the domesticated Albino rat and its parts, as well as some similar data applying to the wild Norway rat, the parent species. It is stated that "the Norway rat (*Mus norvegicus*) is the one mammal now easily obtainable, both wild and as a domesticated form. This latter is represented by either the Albino or the pied rats so common in our laboratories.

"The Albinos are clean, gentle, easily kept and bred, and not expensive to maintain. They are omnivorous, thriving best on table scraps. The span of life is about three years, and breeding begins at three months. Furthermore, the species is cosmopolitan. The litters are large and may be had at any season. The young are immature at birth. The domesticated Albino crosses readily with the wild

Norway. The rat, both wild and domesticated, takes exercise voluntarily, and is susceptible to training. It is also highly resistant to the usual wound-infecting organisms. For a number of lines of study, therefore, the rat seems to be a peculiarly suitable animal."

The observations presented in the tables have been made mainly on rats in the first year of life, and the data, therefore, applied to the rat in its most vigorous period. "Since the quantitative data appearing in the tables are biological, they naturally exhibit more or less variability and reflect in each instance something of the conditions under which they have been obtained. It follows, therefore, that they must not be expected to possess the precision of physical or chemical determinations. Nevertheless, so long as the values here presented are not mistaken for absolute standards representing ideal or final determinations, they may be used with advantage."

In the physiological standardization of drugs the experiments are usually performed on the frog, the guinea-pig, and the cat. It is very doubtful if the experimenters have access to fundamental data and tables such as are presented here on the rat. There will continue to be wide discrepancies among different experimenters on various animals until tables based on formulas for these several animals have been computed. These will require a vast amount of time, and it is doubtful if the researches are as extensive or as carefully worked out as those on the rat. This work of Dr. Donaldson is deserving of the careful study of all those engaged in the practical testing of drugs on animals. It is, furthermore, quite likely that for constancy of results the rat will supersede all the other animals which have been used. This is probable because, in the use of the formulas of Dr. Donaldson, it is possible to obtain values of precision for the results obtained.

H. K.

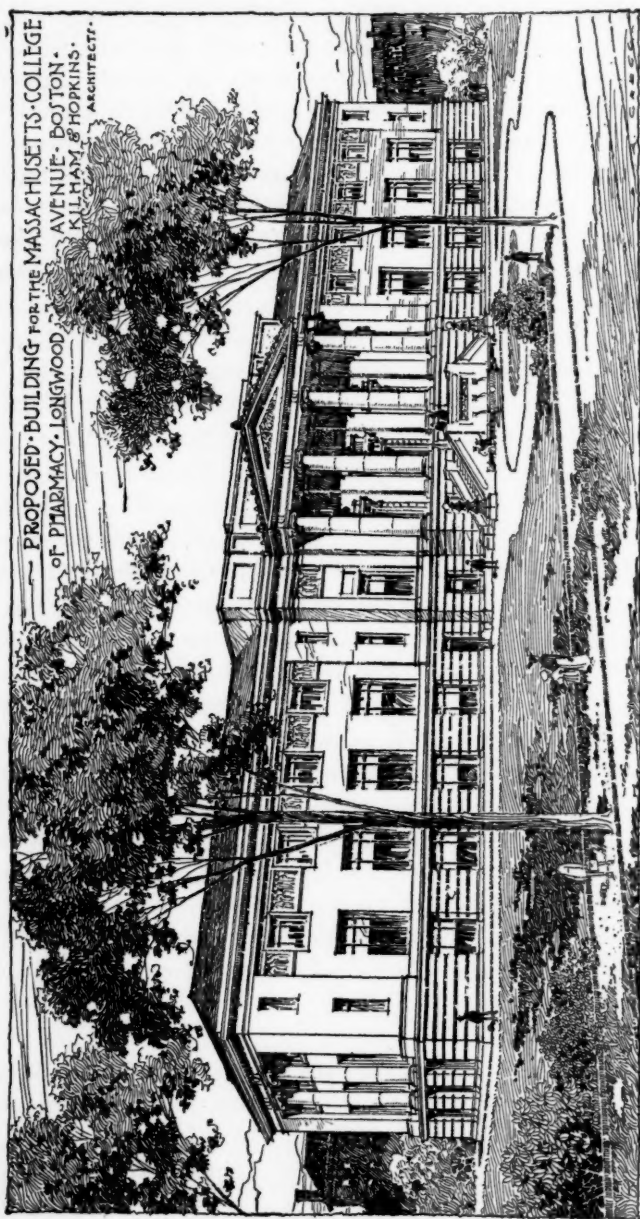
EDITORIAL.

MASSACHUSETTS COLLEGE OF PHARMACY.

It is cause of great satisfaction to learn that the Massachusetts College of Pharmacy is actively planning for a new building, which will be located very near the new buildings of the Harvard Medical

School in Boston. The Massachusetts College of Pharmacy is in possession of an endowment of \$240,000, made up of donations and legacies given to the college at various times. It is doubly gratifying to note that these funds have never been required to maintain the institution, and that they constitute the permanent endowment of the college. Every one interested in educational work will felicitate the college and look forward anxiously to the results of its work. Professional education is always expensive, and no institution of to-day can maintain itself solely by the fees received from students. The actual cost of teaching varies from two to ten times that paid by the students in fees. This fact alone should cause the alumni of every institution to return to their Alma Mater, in the form of donations and bequests, the difference it cost to educate them. With some of the anxiety and worry removed in connection with the financial support of the institution, the faculty of the Massachusetts College can concentrate its attention to the educational problems which will confront our profession in the future. This college has great opportunities and should become a model institution, both in its curriculum and character of graduates. We hope that the college will not take up new theories, but will aim to develop the best type of professional pharmacists, the graduates of whom will favorably compare with those of medicine of the Harvard Medical School, in which atmosphere this college will develop. We have no doubt that the faculty of the Massachusetts College will rise to their opportunities and fulfil their trust with credit to themselves and due concern to the wishes of the donors and those interested in the development of pharmacy. We are fortunate in being able to show a perspective drawing of the proposed building for the Massachusetts College of Pharmacy. Furthermore, as very great interest in this college will naturally be aroused, it would seem well to publish a historical sketch of the college since its foundation in 1823.

The preparation and the publication, in 1820, of the first United States Pharmacopoeia necessarily caused an increased interest among physicians and apothecaries in pharmaceutical science. In 1822 a committee was appointed, in Boston, to draft a constitution and by-laws for a pharmaceutical association. The report of this committee, made in December, 1822, was adopted at the formal institution of the Massachusetts College of Pharmacy, in February, 1823.



Perspective drawing of a new building planned for the Massachusetts College of Pharmacy.

The objects of this organization were: to provide the means of systematic education, to regulate the instruction of apprentices, to promote a spirit of pharmaceutical investigation and to diffuse information among the members, to discountenance the sale of spurious and inferior articles, to regulate the business as far as practicable and consistent with social institutions, to cherish habits of friendly intercourse, and, in general, to advance the character and interests of the profession.

Meetings of the college were held semi-annually at first, and then quarterly, and appropriations were made for the library and for cabinets, and the collection of books and of specimens was begun. Efforts were made to establish a course of instruction for apprentices, and much attention was given to the subject of uniform prices in the stores. The college continued to exist along these lines until it was thoroughly reorganized, in 1851, with a membership composed about equally of old and of new members. The constitution and by-laws were revised, and pharmaceutical meetings, especially devoted to scientific purposes, were appointed for each month. In February, 1852, the college petitioned the General Court for an act of incorporation, which was secured on April 3, 1852; in February, 1876, it was amended and indefinitely extended, and it was again amended in 1881, in 1888, and in 1913.

Courses of lectures on chemistry were delivered during the winter of 1853 by Charles T. Jackson, M.D., and during the following winter by Professor J. P. Cooke, Jr., of Harvard College. These lectures were especially prepared with reference to the needs of pharmacists. During the winter of 1858-59, Mr. Charles T. Carney gave a course of six lectures on pharmaceutical chemistry. These courses of lectures were delivered before the members of the college and were attended by but few of the clerks.

In the spring of 1867 the Board of Trustees authorized a committee to ascertain if a sufficient number of young men employed in Boston drug stores could be enrolled to warrant the formation of a class. They invited all eligible to meet at the college rooms, where, on March 27, about twenty responded to the call, and were formed into a class by Mr. Markoe, who inaugurated a course of nine free lectures on practical pharmacy. This informal beginning promised so well that the college resolved to establish a permanent school of pharmacy, and secured as lecturers Messrs. Cyrus M. Tracy, upon

materia medica and botany; E. L. Stoddard, Ph.D., upon chemistry, and George F. H. Markoe, upon pharmacy.

During the first session of the school the course in chemistry was given in the building of the Massachusetts Institute of Technology, Prof. F. H. Storer assisting in organizing this course, while the other two courses were given at the college rooms, on Temple Place. The class numbered thirty-five students.

In October, 1868, the lecturers of the first session were appointed professors for 1868-69, and all the lectures were given at No. 8 Boylston Street, where the school continued till the session of 1876-77, when it removed to the Mayhew School building, on Hawkins Street. Here it was burned out, on January 23, 1877, and the rest of that session was held at the Massachusetts Institute of Technology. In 1878 the college occupied the old Franklin School building, on Washington Street, where it continued its work until October, 1886 when it removed to its present building, which was constructed for its special use.

Since the early days of the college the original courses have been improved and developed and others added, until now the required work of the regular course comprises two years of each of these subjects: general chemistry, botany and materia medica, analytical chemistry, and theoretical and applied pharmacy, and one year each of arithmetic, Latin, and organic chemistry. There is also a post-graduate year with courses in commercial pharmacy, bacteriology, advanced materia medica and microscopy, and advanced analytical chemistry and urine analysis.

The attendance at the college has increased until now there are nearly three hundred students, and the present building, erected in 1886, is crowded to the extreme limit of its capacity. The need of a new building has become absolutely imperative. Anticipating this need, the college, in 1912, purchased a fine site at the corner of Brookline and Longwood Avenues, Boston, in the district which has become, during the last decade, one of the largest medical centres in the country. In this neighborhood are now located the Harvard Medical School (with its four-million-dollar group of white marble buildings), the Brigham Hospitals, the Children's and Infants' Hospitals, the Huntington Cancer Hospital, the Deaconess' Hospital, the Angell Animal Hospital, Harvard Dental School, Tufts Medical and Dental Schools, the Carnegie Nutrition Laboratory, and other institutions of a similar character.

During 1915 the Trustees chose Kilham and Hopkins, of Boston, an architectural firm which has designed many educational buildings, to prepare preliminary plans and sketches for a college building for this new site. The architects have worked out very cleverly the suggestions given them as to the number and location of rooms, etc., the floor plans giving as much general satisfaction as does the beautiful and imposing exterior. The building has a frontage of 230 feet, and will face on Longwood Avenue. As the lot contains about 60,000 square feet, there will be plenty of room for lawns and planting, to give the building its proper setting, and its impressive character will add much, in the eyes of the general public, to the dignity of the profession of pharmacy.

The first floor is to be at ground level, and will contain the chemistry and pharmacy laboratories, with apparatus rooms and instructors' rooms, a large study for men students, and also the heating plant and janitor's workshop, and the stack-room of the library. The middle or main floor will contain two lecture rooms, each with about three hundred seats, the Trustees' room, general offices, library, women's study, and rooms for the professors. The upper floor will contain the materia medica laboratory, with its stock-room, the bacteriology laboratory, recitation rooms, alumni room, and other rooms of varying size and importance, besides a large assembly room (in the central portion of the building) with a capacity of five hundred seats, a stage at one end, and store-rooms and retiring rooms adjoining. This assembly hall may be used for conventions, receptions, and other social purposes, and for the commencement exercises of the college.

The proposed building, with its equipment, exclusive of its site, will cost in the neighborhood of \$200,000. A part of this will be obtained by the sale of the present building and its site, and a part is being raised by a campaign now under way. It may be necessary to put a mortgage on the building for a part of its cost, but it is hoped that this will be small in amount.

Since 1872, when Mr. Charles French, of Boston, left \$2000 to the college, a number of donations and legacies have been received, varying in amounts from \$200 to about \$200,000. These funds are held by the Trustees of Funds (a special board appointed to care for them), the investments being restricted by the college by-laws to such securities as are legal for the savings banks of Massachusetts. These funds amount now to about \$240,000, and constitute the permanent endowment of the college, of which only the income is used.

PHILADELPHIA DRUG EXCHANGE.

ANNUAL MEETING.

The fifty-fifth annual meeting of the Philadelphia Drug Exchange was held in the afternoon of January 25, 1916, in its rooms at the Bourse. The occasion was featured by a reception to Dr. Eugene G. Eberle, formerly of Dallas, Texas, editor of the *Journal of the American Pharmaceutical Association*, the office of which is now located in the rooms of the Drug Exchange.

The election of officers resulted as follows: President, John Fergusson; vice-president, Harry B. French; secretary, Joseph W. England; treasurer, Anthony M. Hance; directors, Charles E. Hires, A. Robinson McIlvaine, Dr. Adolph W. Miller, Adam Pfromm, Adolph G. Rosengarten, Clayton F. Shoemaker, Richard M. Shoemaker, and Walter V. Smith.

The annual report of the Board of Directors was read. It gave a comprehensive review of the general business conditions of the country during 1915, and referred to the drug trade, as follows:

"When we consider the position of the wholesale drug trade during these months, we face an entirely different set of conditions. One year ago, the first excitement arising from the war had largely subsided, and prices of foreign goods, as a rule, were gradually declining. Early in the year, however, the embargo placed by the German Government upon exports of chemicals and dyestuffs completely changed market conditions, and since that time the prices for German chemicals have been steadily advancing, until at the present time a few articles cannot be furnished at all, with the prospect that this list will be added to materially as time goes on. It has been a great hardship to many that large stocks of goods which were purchased and paid for by citizens of this country before the date of the embargo have not been permitted to be shipped by the English Government, notwithstanding its promise to do so. Likewise it was thought that during the year the prices of goods from the Far East would be materially reduced. They had been extremely low because of the restriction of their markets, and it was thought that this condition would operate to bring prices still lower. Recently,

however, the activities of submarines in the Mediterranean Sea have been so great that, added to the scarcity of ships, the result has been that the prices of goods from the East Indies, China, and Japan have been tremendously advanced.

"The Harrison Narcotic Law has now been in force for nearly a year, and is generally conceded to have worked successfully. It has been estimated that the sale of narcotics in the ordinary channels of trade has been reduced about 80 per cent. There have been some minor violations, but these are being carefully looked after in most cases by the U. S. Government officials, and there seems to be a general satisfaction with the law and its enforcement.

"The Special Stamp Act, passed by Congress about a year ago, and which was to have expired on December 31, was extended for another year, by the joint action of both Houses, and signed by the President, so that it is now a law. This was not accomplished without a spirited discussion, but in view of the financial condition of the government it was only to be expected. This law bears oppressively upon the drug trade, and we should miss no opportunity to express our disapproval of it.

"Another matter which is deeply interesting to the wholesale drug trade and our friends, the manufacturers of proprietary medicines, has been the war declared upon the latter by the New York City Board of Health. This body, acting upon the authorization of the Legislature of the state of New York, some months ago passed a rule requiring that all proprietary remedies must bear upon their labels the names of the active medicinal ingredients contained therein, or that these names must be filed with the Board of Health in advance of January 1. Proprietary manufacturers regarded this action as a confiscation of their property, without compensation, and have determined upon active and bitter opposition. Three applications were recently made by different houses, representing different lines, for a preliminary injunction to prevent the Board of Health from carrying out their plan. These applications will be heard in a few days. In the meantime, laws of this kind have been passed in three states of the Union, but up to this time have not been enforced.

"So far as our own state is concerned, your Committee on Legislation had a period of considerable activity. We used our efforts to help defeat three measures, especially, which we regarded as highly detrimental to our line of business.

"The first was a bill providing that all disinfectants must bear on their label the carbolic coefficient percentage. As this can only be applied to disinfectants of a certain class, it would virtually have prevented the use of formaldehyde, either alone or in combinations, and likewise of other valuable forms of disinfectants.

"Another bill which was defeated provided for a patent medicine labelling clause, similar to the one which is now being so bitterly fought in New York City.

"A third was a bill providing that insecticides and fungicides must bear a formula for their ingredients on the label, and this was subject to the same objections as the Patent Medicine Labelling Bill.

"There were likewise several pharmacy bills introduced, but none of them were passed, and in this connection we let it be distinctly understood that we do not look with favor upon the passage in this state of a narcotic law which differs in its provisions from the national law.

"In addition to this legislative work, your Board took action in a number of other matters which are important to our line of business, and among our other activities we heartily endorsed the principles of the Stevens Price Protecting Bill. This bill gives the manufacturers of branded goods the legal right to make contracts for the maintenance of the re-sale price of such goods. Under the law as it stands now, the manufacturer may brand his goods, but he has no legal right to fix their re-sale price and protect himself against predatory cutting. While the primary effect of price-cutting on branded goods may be of benefit temporarily to the public, the secondary effect is inexcusable injury to the public, due to substitution of cheaper and inferior goods and the elimination of the branded goods.

"In this connection it is also interesting to note that a few months ago Judge Hough, in the U. S. District Court of New York, decided in the Cream of Wheat case that the manufacturer of an article has an unquestioned legal right to refuse to sell his goods to any buyer, for any reason, however capricious, and this decision was later confirmed by the U. S. Circuit Court of the District.

"As we stand to-day and look towards the future, there are some things plainly evident to which we wish to call your attention. The past year, owing to the sensational character of business, has afforded opportunities for a rather better profit than usually obtains in our line. During a period of rapid and unexpected changes the

shrewd business man generally secures a better profit than he does during periods of steady prices; at the same time, we must all bear in mind that some of these days the war will end and that the prices which have so largely advanced will be largely reduced. We must be prepared for radical changes in prices, in volume, and in competition, and we should not allow ourselves to be overconfident, or our business overextended.

"One of the usual features of our annual report is absent this year, and that is the list of deceased members. On going over our records we do not seem to find that any member of this association has died during the year. It will thus be seen that membership in the Philadelphia Drug Exchange is a valuable asset. It brings with it a sense of duty well performed and a feeling of comfort which tends to longevity.

"In conclusion, your Board of Directors again wish to remind you of the work which is constantly being done by your officers in your behalf. We feel that last year, especially along the lines indicated, we were especially helpful. This service is gladly and cheerfully performed, the only desire on the part of your officers being to make the work of the association as effective as possible. No opportunity should be neglected to inform others of the value of the Philadelphia Drug Exchange as a working base, from which, in case of need, definite action may be promptly and judiciously taken. It frequently happens that new members may be obtained by proper effort at the proper time, and the importance of this is urgently recommended to you."

ANNUAL DINNER.

With more than 150 members and guests participating, the annual dinner of the Philadelphia Drug Exchange, the evening of January 28, 1916, was unquestionably the best attended and the most enjoyable in the history of that time-honored organization. It was a fitting celebration of the era of prosperity through which, as indicated in the various addresses, these immense interests, representative of the drug, chemical and allied industries, are passing. It took place in the Ritz-Carlton Hotel.

Following a policy of many years' standing, the speakers for the most part avoided more than passing references to the business of the men whom they were addressing. But two stirring addresses on preparedness commanded breathless attention, and were followed by

so enthusiastic applause as to leave no doubt of the good red blood and the intense patriotism of these captains of industry in the membership of the Drug Exchange.

An informal reception preceded the dinner and brought together the many visitors from New York, Baltimore, Trenton, and other adjacent cities, as well as the older and the younger men in the local drug trade—the latter the débutantes in the trade; for with the manufacturing and wholesale drug and chemical interests in Philadelphia, one is really not considered properly affiliated until he has attended a Drug Exchange banquet. Then his standing from a sentimental standpoint at least is assured. And on the evening of the dinner there were scores of these younger men, ready to succeed to the responsibilities of their fathers as the latter gradually pass them along to more youthful shoulders.

Shortly after 7 o'clock Chairman Walter V. Smith, of the Entertainment Committee, gave the signal and the guests were ushered into the banquet hall. Formality was observed only at the officers' table, about which were grouped the officers of the exchange and their guests. At a score of smaller tables the members were seated, without special arrangements, for the committee was of the opinion that such a plan favored more of informality than the seating at separate tables of the representatives of any one firm or corporation.

Led by professional singers, between courses the diners joined in the popular airs with a freedom that indicated that the cares of business had no part in a Drug Exchange dinner. Although a strictly dry dinner, it did seem to the close observer that the greatest harmony and enthusiastic volume prevailed in the rendition of "The Stein Song," which every one seemed to know and enjoy so well that it was repeated several times.

It was on the stroke of 9 o'clock that President John Fergusson, in his capacity of toastmaster, rapped for order and then impressively expressed the pleasure of the officers of the Drug Exchange in having this unusually large gathering of its friends at the annual function. He referred briefly to the great activity of affairs in the drug, chemical and allied trades during the past year. Then he mentioned the coming to Philadelphia of the *Journal of the American Pharmaceutical Association*, and that, upon the invitation of the Drug Exchange, its home would be in the offices of that organization in the Bourse.

He then introduced the first speaker, Dr. Eugene G. Eberle, its editor, declaring that "he seems to be the most popular man in the drug trade to-day."

In a most interesting manner Dr. Eberle reviewed the more than half-century of the association's existence and mentioned the names of some of the Philadelphians who had been identified with these earlier events and their altruistic efforts that had reverted so advantageously to the pharmacists of to-day. Many of the problems that confronted the leaders in pharmacy and chemistry in those days, he said, were now easy for the student at college. He made a strong plea for closer coöperation between the universities, the colleges, and schools where pharmacy is taught, and the commercial interests in pharmacy and chemistry. He showed that those educational institutions should not be solely dependent upon the pupils for their incomes, but that wealthy men who realized the particular value of such institutions should come forward and provide for their greater effectiveness with endowment funds. The speaker closed with a pledge of coöperation on the part of the *Journal*, and expressed the hope that his friends among the members of the exchange would help him to make the *Journal* serve in a broader way, if possible, the aims and policies of the association and the interests of pharmacy in general.

In the person of Leroy Oldham, the Baltimore Drug Exchange sent a most able representative. He mentioned the pleasure of the members of that organization in having Harry B. French, the vice-president of the Philadelphia Drug Exchange, at its annual meeting a year ago, and then, in true Southern fashion, welcomed the Philadelphians and their guests at any time to Baltimore and the home of the Exchange. Mr. Oldham then delighted his audience with incidents showing the characteristics of the old negro "mammy" and "uncle," many of which had occurred in his own boyhood days.

And then the guests were brought face to face with the grave conditions that confront them as business men of the United States when former Congressman Reuben O. Moon, a member of the Philadelphia Bar, pointed out the dangers of the policy of preparedness. He showed how after centuries spent in perfecting the world's civilization it had been proved to be but a veneer that had been swept aside by the nations of Europe in their return to barbarism. The great defect in that civilization had been the worship of effective-

ness. He showed that the great danger of military preparedness was in being swept over the line through a knowledge of its existence.

"You business men are really the potent factors in these situations," he declared, "and you are the men who will finally solve these problems. The politicians now and then rise above you in their seeming command of the situation, but it is men like you and organizations like the Philadelphia Drug Exchange that are the real factors. I beg of you, guard against this danger of being swept over the line just as the nations of Europe have done, through military preparedness."

In strong contrast to the conservative views of Mr. Moon were those of the next speaker, the Rev. Robert Johnston, rector of the Church of the Saviour. He explained that he had intended to speak in lighter vein, but that he could not, after hearing the address of the preceding speaker.

A native of Great Britain, but now a citizen of the United States, with an intensity that was keenly felt by his hearers, Dr. Johnston told how he was proud and happy in the country of his adoption, but that he wanted to feel that if the time came he could receive the protection that he had been promised under the Stars and Stripes.

"I don't believe in the danger of militarism," he declared, "but I do believe in the effect upon others of being prepared on general principles to maintain our dignity and our position."

In his opinion the time is not far distant when the United States must show that it is prepared to back up its position in order to have other nations give proper consideration to its demands. "The way to offset the impression of a battleship is with two battleships," he said in closing. "Surround our great coast lines with a wall of steel. When we can keep foreign soldiers off our shores, we won't need much of an army to kill them off."

In close keeping with the subjects discussed by Messrs. Moon and Johnston was the description of the recent trip of the Liberty Bell from Philadelphia to San Francisco, given by Councilman Joseph P. Gaffney, a member of the committee which accompanied this revered relic from this city. Stereopticon views showed how the patriotism of the entire country had been stirred by the sight of the old bell that had proclaimed the freedom of the American people so many years ago. They supplemented the words of the lecturer, who declared that apparently those people stood ready now as they did then to resent any foreign encroachment.